## REMARKS

Claims 1-57 and 82-103 remain pending in the application. Claims 58-81 are here cancelled as being drawn to non-elected subject matter.

Claims 1, 6, 21, 82-88, 94-95 and 103 are here amended. Support for the amendments to claims 1, 82-88 and 95 can be found in the specification, e.g. on page 37, lines 20-22; page 37, line 30 – page 38, line 3; and page 33, lines 12-21.

Claims 6, 21, 27, 94, and 103 are amended to correct clerical errors involving chemical formulas, and claim 103 is amended to correct a non-technical clerical error. Support for the amendments to chemical formulas can be found in preambles, for example of claim 21, and in other claims such as claim 18, as originally filed. Support for the amendment to claim 103 is found in this claim as added previously. No new matter has been added by these amendments.

### Issues under double patenting

Applicants acknowledge the Examiner's withdrawal of rejection of claims 1-3, 8-11, 18-28 and 54 under 35 U.S.C. § 101 as claiming the same invention as claims 8-25 and 27-32 of patent application having serial number 09/546,085.

Claims 1-57 and 82-103 have been provisionally rejected under the judicially created doctrine of obvious-type double patenting in view of claims 8-41, 63-64, and 78-88 of patent application 09/546,085. Applicants here enclose terminal disclaimers disclaiming any term of allowed claims in a patent issuing from the present application beyond the term of allowed claims that would issue from the 09/546,085 application. Therefore, this rejection is rendered moot for claims pending in the present application with respect to claims pending in patent application 09/546,085.

Claims 1-3, 13, 18-24, and 84-103 have been rejected under the judicially created doctrine of obviousness-type double patenting over U.S. patent 6,048,695. Applicants here

[illegible] claims pending in the present application with respect to claims in patent 6,048,695

Applicants respectfully request that rejections based on double patenting be withdrawn.

Issues under 35 U.S.C. § 102

Plueddemann et al. U.S. Patent No. 4,231,910

Applicants acknowledge the Examiner's withdrawal of the rejection of claims 1-3, 12, 13, 15, 23-28, and 32-34 with respect to Plueddemann et al.

Krinski et al. U.S. Patent No. 4,713,116

Applicants acknowledge the Examiner's withdrawal of rejection of claims 1-3, 12, 13, 15, 23-28 and 32-34 with respect to this reference.

Claims 1-3, 18-19, and 84-87 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Krinski et al. The legal standard for anticipation under 35 U.S.C. § 102 is one of strict identity. To anticipate a claim, a single prior source must contain each and every limitation of the claimed invention. The Examiner asserts, on page 4, paragraph 6A of the Office Action, that the rejection of claims 1-3 and 18-19 remains because "a composition comprising an antibody, or a small molecule" meets the limitations in the prior art. Applicants respectfully disagree and offer the following arguments with respect to an antibody. Further, Applicants have amended claims with respect to the small molecule.

Krinski et al. reads, "[t]his invention relates to a modified vegetable protein adhesive material useful as a binder and pigment structuring additive for paper coatings as well as a process for producing the same." (*See* Krinski, column 1, lines 7-10, emphasis added). Krinski further states, "The present invention applies to modified protein material suitable as an adhesive in paper coating compositions." (*See* Krinski column 3, lines 8-10).

Applicants traverse the Examiner's statements referring to antibodies in the claims. Claims 1-3, and 18-19 do not mention antibodies, however these claims are directed to peptidomimetics. The specification defines peptidomimetics at page 21, lines 11-12, ".. 'mimetic' and 'peptidomimetic' refer to synthetic chemical compounds." Krinski does not show

With respect to the phrase "small molecule", the Examiner asserts that the term could apply to a polypeptide as taught by Krinski. Applicants disagree, pointing out that the term "polypeptide" is distinct from "oligopeptide" such as a di- or tri-peptide. The term polypeptide is in fact frequently used interchangeably with protein, and is considered a macromolecule rather than a small molecule such as an oligopeptide.

Nevertheless, Applicants have amended claim 1 so that it is directed to small molecules that are not biological polymers. Therefore, the small molecules within the scope of the claims as amended are not shown by Krinski.

Applicants request that this rejection be withdrawn with respect to claims 2-3 and 18-19, which depend directly or indirectly from amended claim 1 and so are likewise amended.

Applicants have also amended claims 84-87 to stipulate that the biological molecule must be a nucleic acid or an analog or mimetic thereof, a polysaccharide or an analog or mimetic thereof, a lipid or an analog or mimetic thereof, a peptidomimetic or a nonbiopolymeric small molecule. Krinski does not include these biological molecules. Therefore these claims as amended are novel claims in view of Krinski. Applicants request that rejection of claims 84-87 with respect to Krinski be withdrawn.

Therefore, in light of the amendments to the claims and arguments herein, Applicants request that rejections in view of Krinski be withdrawn.

Beattie et al. U.S. Patent No. 6,426,183

Claims 1-3, 12-15, 23-28, and 32-38, 47, and 82-91 have been rejected in paragraph 6C, p. 5 of the Office Action under 35 U.S.C. § 102(e) as being anticipated by Beattie et al. The legal standard for anticipation under 35 U.S.C. § 102 is one of strict identity. To anticipate a claim, a single prior source must contain each and every limitation of the claimed invention.

The Examiner states that Beattie teaches attaching a biological compound to a silaceous or silane containing substrate. In fact, the silane groups described by Beattie are attached ab initio to a substrate that is insoluble, such as glass. Applicants assert that, unlike Beattie, claims 1-3, 12-13, and 15 are not directed to biological molecules attached to a substrate. Nevertheless

Therefore Beattie does not anticipate claim 1, nor does it anticipate claims 2-3, or 12-15 which depend directly or indirectly from claim 1.

The Examiner has also maintained rejection of claim 23 and its dependent claims in view of Beattie. In the Office Action on page 5, paragraph 6, the Examiner states, "Beattie discloses...a modified biological molecule (oligonucleotides) immobilized to said solid support." Applicants respectfully disagree.

Claim 23 is directed to an article of manufacture, and clearly states, "...before attachment to the surface, the biological molecules are modified by reaction with a compound having the formula: $R_1$—X—$R_2$, wherein $R_1$ is a cyclic either group or an amino group, $R_2$ is an alkoxysilane group..." (emphasis added). Beattie in contrast discloses only silane groups that are first attached to a substrate, and then are bound to a modified biological molecule. Beattie does not show, as in the claims of the present invention, the silane group first being bound to the biological molecule, and then later bound to the substrate. Therefore, Beattie does not anticipate claim 23, nor does it anticipate claims 24-28, 32-38 and 47 which depend directly or indirectly from claim 23. The differences in temporal order result in differences in the product, since the modified biological molecules have greater flexibility for further use in terms of potential attachment to a variety of different substrates.

The Examiner has also rejected claims 82-91 in view of Beattie. In the Office Action on the bridging paragraph of pages 6 and 7, the Examiner states, "Beattie discloses that the modified biological compound comprises oligonucleotide, DNA, peptides, or a protein... Thus the disclosure of Beattie also meets the limitations in the instant claims."

Applicants have amended claims 82 83, and 86-88 to stipulate that the alkoxysilane group must be soluble in solution. Beattie does not show this limitation. Claims 89-91 depend from claim 88, so they take on any limitation of claim 88. Therefore, Applicants submit that Beattie does not anticipate claims 82, 83, and 86-91 as amended. Therefore, Applicants request that this rejection be withdrawn.

Applicants have also amended claims 84 and 85 to stipulate that $R_1$ must be a cyclic ether group. Beattie does not disclose this limitation, and so does not anticipate claims 84 and 85

Applicants request that this rejection be withdrawn.

Gray et al. U.S. Patent No. 5,851,769

Claims 1-3, 11-15, 18, 20, 22, 84-91, 95, and 100-102 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Gray et al. The Office Action on page 8, paragraph 9, states that Gray teaches a biological molecule bound to a compound with the formula $R_1$—X—$R_2$, wherein $R_2$ is an alkoxysilane.

However Gray does not describe such a compound which is soluble in solution. Rather, it is Gray's solid substrate that contains the alkoxysilane. For example, Gray states in column 19, lines 49-51; "...standard microscope slides and coverslips are treated with 3-aminopropyltriethoxysilane (APS)."

Applicants have amended claim 1 to stipulate that the alkoxysilane is soluble in solution. In contrast to Gray, in the present invention nucleic acid, is bound to alkoxysilane in solution, and the alkoxysilane not attached to the substrate. Support for this interpretation is found in the specification of the present invention, which states:

> The following example describes making and using one aspect of modified nucleic acid of the present invention. The purpose of the chemical modification is to enable the nucleic acid to be readily affixed to an underivatized solid surface. In this example, the nucleic acid--preferably DNA--is modified by reaction with 3-glycidoxypropyl-trimethoxysilane (GPTS), according to FIG. 1. GPTS has in fact been previously used to derivatize a glass surface upon which (unmodified) DNA samples are then contacted and immobilized. Yet the use of GPTS is for the opposite purpose: to modify the DNA for subsequent attachment to an underivatized glass surface, has not been previously disclosed nor suggested. Moreover, GPTS--since it contains an epoxide group--is known to damage DNA *in vivo*. For these reasons, its use to derivatize DNA is actually discouraged by the prior art. [See page 29, lines 10-20 of the specification].

Joining an alkoxysilane group in solution to a biological molecule is not taught by the prior art, including Gray. Nevertheless, claim 1 has been amended to emphasize this distinction. As claims 2, 3, 11-15, 18, 20 and 22 depend directly or indirectly from claim 1, they are similarly amended.

Request that rejection of claims 84 and 85 be withdrawn as novel with respect to Gray.

Applicants have amended claims 86-88 and 95 to specify that the alkoxysilane group used to modify the biological molecule is soluble in solution. The 3-aminopropyl-triethoxysilane shown by Gray is attached to the substrate before it is bound to the biological molecules. Thus Gray does not show modification of a biological molecule with a compound soluble in solution. Applicants request that rejection with regards to Gray of claims 86-88, and of claims 89-91, 100 and 101 which depend directly from amended claims 88 and 95, be withdrawn.

Applicants respectfully disagree with the Examiner with respect to rejection of claim 102. Claim 102 of the present application specifies that the biological molecule must be modified "before attachment to the surface". Gray discloses a method in which the biological molecule is modified as it is attached to the surface. Gray's method produces an attached biological molecule, and the article of manufacture of claim 102 requires a free-standing modified biological molecule as an intermediate prior to attachment to the surface. Gray does not show this limitation of claim 102, therefore Gray could not have anticipated the article of manufacture of claim 102. Therefore, Applicants request that this rejection be withdrawn in regards to claim 102.

Therefore, Applicants respectfully request that rejection of the present claims in view of Gray be withdrawn.

## CONCLUSION

Applicants submit that the claims as here amended put the application in condition for allowance, and such action is respectfully requested.

Should any questions or issues arise concerning the application, the Examiner is invited and encouraged to contact the undersigned at the telephone number provided below.

Respectfully submitted,

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